The volcanic activity with caldera formation is one of the most catastrophic phenomena on the Earth so that geological, petrological, geochemical and geophysical studies have been accumulated (Furukawa et al., 2009). From those studies, it is believed that huge amount of silicic magma chamber have been formed before caldera formation and eruption of pyroclastics is occurred by any trigger (e.g. Hildreth and Wilson, 2007). To explain the genesis of the silicic magma, several models have been proposed as follows, 1) fractional crystallization of mafic magma with crustal assimilation (AFC model) [e.g. 1 - 3], 2) partial melting of basaltic lower crust [e.g. 4, 5] and 3) partial melting of basaltic rocks, which have solidified just before the silicic magama activity, settled on the lower crust [e.g. 6, 7]. Thus, the genesis of caldera forming silicic magma is still controversial. To be elucidated the magama genesis, investigations of magmas of pre-, intra or post-caldera caldera stages are useful, because there is a possibility that the producing of next caldera forming eruptions is proceeding during those stages of volcanic activities [e.g. 8, 9]. Sakurajima volcano is the post-caldera volcano of Aira caldera, situate on volcanic front of Ryukyu arc, southern Kyushu Island, Japan (10). After the Aira caldera formation at ca. 25 ky (10), the volcanism of Sakurajima started at ca. 22 ky and still active at present (11). Therefore, Sakurajima can be considered as one of the suitable volcano to investigate the genesis of caldera forming silicic magma. However, geochemical study for Sakurajima volcano is restricted to lavas erupted at historical ages. Therefore, we collected volcanic rocks, mainly lava samples, from nearly all the volcanic unit defined by (12), and carried out petrological and geochemical study. In additions to Sakurajima samples, investigation to basaltic rocks occurred closed to Aira caldera to estimate the primary magma of Sakurajima volcano.

The volcanic rocks of Sakurajima volcano are consisted with andesite and dacite with mineral assemblage of (olivine) - orthopyroxene - clinopyroxene – plagioclase, and show porphyritic texture with hyaro - ophitic and hyaropilitic groundmass. Most of the plagioclases have dusty zone. From the major element compositions, magmas of Sakurajima show a trend of calcalkaline rock series (13), and classified medium – K (14). The liner trends are observed from Harker diagrams from most of elements excepted for P2O5, Y and Cr. On the basis of model calculation, it is difficult to explain those of trend by fractional crystallization, and magma mixing between mafic and felic magma seems suitable mechanism producing those magmas. MORB normalized trace element patterns show typical island arc character of depletion of high field strength element and enrichment of large lithophile elements. From this observation, primary magma of Sakurajima is generated by partial melting of mantle wedge added the fluids derived from dehydration of subducted Philippines sea plate. The variation of isotopic compositions of Sr and Nd obtained by this study, which lie on the tow component mixing curve between Shikoku Basin basalt (oceanic crust of Philippines sea plate) and terrigenous sediments, support this explanation. It also can be pointed out that basalt collected from besides Aira caldera possible to represent a primary magma of Sakurajima, because the Sr and Nd isotopic composition is plotted on the same mixing curve, although further detailed investigation is necessary.

引用文献